

California Code of Regulations
Title 23. Waters
Division 2. Department of Water Resources
Chapter 5.1. Water Conservation Act of 2009
Article 2. Agricultural Water Measurement

§597. Agricultural Water Measurement

Under the authority included under California Water Code §10608.48(i)(1), the Department of Water Resources is required to adopt regulations that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirements in paragraph (1) of subdivision (b) of §10608.48.

For reference, §10608.48(b) of the California Water Code states that:

Agricultural water suppliers shall implement all of the following critical efficient management practices:

- (1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).*
- (2) Adopt a pricing structure for water customers based at least in part on quantity delivered*

For further reference, §531.10(a) of the California Water Code requires that:

(a) An agricultural water supplier shall submit an annual report to the department that summarizes aggregated farm-gate delivery data, on a monthly or bi-monthly basis, using best professional practices.

Notes:

1. Paragraphs (1) and (2) of §10608.48(b) specify agricultural water suppliers reporting of aggregated farm-gate water delivery and adopting a volumetric water pricing structure as the purposes of water measurement. However, this article only addresses developing a range of options for water measurement.
2. By reference, the agricultural water suppliers reporting agricultural water deliveries measured under this article shall use the reporting format and criteria developed for Water Code §531.

Note: Authority cited: §10608.48 (b), §531.10 Water Code.

§597.1. Applicability

- a) An agricultural water supplier subject to this article shall measure surface water and groundwater that it delivers to its customers, excluding recycled water, pursuant to the accuracy standards in this article.
- b) Agricultural water suppliers providing water to less than 10,000 irrigated acres, excluding acres that receive only recycled water, are not subject to this article.
- c) Agricultural water suppliers providing water to 10,000 or more irrigated acres but less than 25,000 irrigated acres, excluding acres that receive only recycled water, are not subject to this article unless sufficient funding is provided specifically for that purpose, as stated under Water Code §10853.
- d) Agricultural water suppliers providing water to 25,000 irrigated acres or more, excluding acres that receive only recycled water, shall be subject to this article.
- e) A wholesale agricultural water supplier providing water to another agricultural water supplier (the receiving water supplier) for ultimate resale to customers is subject to this article at the location at which control of the water is transferred to the receiving water supplier. The wholesale agricultural water supplier is not required to measure deliveries that the receiving agricultural water supplier makes to the customers of the receiving agricultural water supplier. Canal authorities or other entities that convey or deliver water through facilities owned by a federal agency are not subject to this article.
- f) Pursuant to §10608.8 (d) this article does not apply to any agricultural water supplier “that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect.”
- g) Pursuant to §10608.12(a) this article does not apply to the Department of Water Resources.
- h) A water supplier providing water to wildlife refuges or habitat lands where (1) the refuges or habitat lands are under a contractual relationship with the water supplier, and (2) the water supplier meets the irrigated acreage criteria of §10608.12(a), is subject to this article.

Note: Authority cited: §10828, Water Code.

§597.2. Definitions

- a) For purposes of this article, the terms used are defined in this section.
- 1) “Accuracy” means the measured flow rate, velocity, or volume relative to the actual flow rate, velocity, or volume, expressed as a percent. The percent shall be calculated as $100 \times (\text{measured value} - \text{actual value}) / \text{actual value}$, where “measured value” is the value indicated by the device and “actual value” is the value as determined through laboratory, design or field testing protocols that use best professional practices.
 - 2) “Agricultural water supplier,” as defined in Water Code §10608.12(a), means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding acres that receive only recycled water. “Agricultural water supplier” includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells water for ultimate resale to customers. “Agricultural water supplier” does not include the Department of Water Resources.
 - 3) “Best professional practices” means practices attaining and maintaining accuracy of measurement and reporting devices and methods as described in this article.
 - 4) “Customer” means the purchaser of water from an agricultural water supplier who has a contractual arrangement with the agricultural water supplier for the service of conveying water to the customer delivery point.
 - 5) “Delivery point” means the location at which the agricultural water supplier transfers control of delivered water to a customer or group of customers.
 - 6) “Existing device,” means a measurement device that was installed in the field prior to the effective date of this article.
 - 7) “Farm-gate,” as defined in Water Code §531(f), means the point at which water is delivered from the agricultural water supplier’s distribution system to each of its customers.
 - 8) “In-house built device” means a measurement device that is manufactured by an agricultural water supplier or by others to specifications provided by an agricultural water supplier.
 - 9) “Irrigated acres,” for purposes of applicability of this article, is calculated as the average of previous five-year acreage within the agricultural water supplier’s service area that has received irrigation water from the agricultural water supplier.
 - 10) “Lateral” means a branch of an agricultural water supplier’s distribution system that directly provides water to multiple customer delivery points.
 - 11) “Manufactured device” means a device that is manufactured by a commercial enterprise, often under exclusive legal rights of the manufacturer, for direct off-the-

shelf purchase and installation. Such devices are capable of directly measuring flow rate, velocity, or totalizing the volume of water delivered, without the need for additional components that are built on-site or in-house.

- 12) “Measurement device” means a device by which an agricultural water supplier determines the numeric value of flow rate, velocity or volume of the water passing a designated delivery point. A measurement device may include manufactured device, on-site built device or in-house built device.
- 13) “On-site built device” means a measurement device that is built in-situ on a water conveyance system and may include manufactured devices or in-house built devices as components.
- 14) “Recycled water” is defined in subdivision (n) of §13050 of the Water Code as water that, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur, and is therefore considered a valuable resource.
- 15) “Type of device” means a measurement device that is manufactured or built to perform similar functions. For example, rectangular, v-notch, and broad crested weirs are one type of device. Similarly, all submerged orifice gates are considered one type of device.

Note: Authority cited: §10608.48, Water Code. Reference: §10608.

§597.3 Range of Options for Agricultural Water Measurement

An agricultural water supplier subject to this article may choose any applicable single option or combination of options listed in paragraphs (a) and (b) of this section. Measurement devices shall be certified pursuant to §597.4 of this article.

a) Options Applicable to Measurement at the Locations of Transfer to Delivery Point of a Customer:

An agricultural water supplier shall measure water delivered to each customer delivery point using one of the following:

- 1) A measurement device installed after the effective date of this article shall be certified to be accurate by flow rate, velocity or volume to within:
 - A. $\pm 5\%$ in the laboratory when using a laboratory certification;
 - B. $\pm 10\%$ when installed in field when using non-laboratory certification.

Or,

- 2) A measurement device installed prior to the effective date of this article shall be certified to be accurate to within $\pm 12\%$ by flow rate, velocity or volume. After

replacement of an existing measurement device, the new or replacement device must meet the requirements of paragraphs (a)(1) of this section.

b) Options Applicable to Measurement at Upstream Locations of the Delivery Points to Multiple Customers:

An agricultural water supplier shall measure water delivered to each measurement location upstream of more than one customer delivery points using one of the following:

- 1) A measurement device installed after the effective date of this article shall be certified to be accurate by flow rate, velocity or volume to within:
 - A. $\pm 3\%$ in the laboratory when using a laboratory certification;
 - B. $\pm 6\%$ when installed in field when using non-laboratory certification.

Or,

- 2) A measurement device installed prior to the effective date of this article shall be certified to be accurate to within $\pm 10\%$ by flow rate, velocity or volume. After replacement of an existing measurement device, the new or replacement device must meet the requirements of paragraphs (b)(1) of this section.

An agricultural water supplier choosing an option under paragraph (b) shall provide documentation in its Agricultural Water Management Plan(s) submitted pursuant to Water Code §10826 of paragraphs (A) and (B) as follows:

A) Its customer delivery points meet any one of the following conditions:

- (i) The agricultural water supplier does not have legal access to the customer delivery point to install, measure, maintain, operate, and monitor the measurement device, or;
- (ii) The agricultural water supplier has determined that the applicable accuracy standard of 597.3(a) cannot be met with a single measurement device due to large fluctuations in flow rate or velocity at the customer turnout during the irrigation season, such as occurs for rice cultivation, where the finding has been reviewed, signed and stamped by a registered Professional Engineer. The large fluctuations limitation must be applicable where the predominant irrigated areas of the customer delivery points are downstream of the identified measurement location.

And,

B) The methodology the agricultural water supplier uses to apportion the quantities of water delivered to individual customers must meet all of the following criteria:

- (i) It must account for differences in water use among individual customers, using information that shall include the recording of the time at which each individual customer's delivery starts and ends, and that may also include, but is not limited to, the irrigated acreage, crop, and on-farm irrigation system, and account for variances in a customer's use throughout the year, and;
- (ii) It must be sufficient for establishing a pricing structure based at least in part on quantity delivered, and;
- (iii) It must be formally approved by the agricultural water supplier's governing body (e.g., Board of Directors).

§597.4 Certification and Performance Requirements of Measurement Devices

a) Certification Requirements:

Certification of an individual device or type of device, as required in §597.3, shall be conducted and documented by any of the following:

1) For devices installed after date of this Article, certification may occur through either:

A) Laboratory Certification, where certification is documented by an entity, institution, or individual that demonstrates testing followed industry established protocols such as the National Institute for Standards and Testing (NIST) traceability standards, where the documentation presents the results of laboratory testing of an individual device or type of device.

Or,

B) Non-Laboratory Certification, where certification is documented by either:

(i) An affidavit signed and stamped by a registered Professional Engineer reviewing and approving either (1) the design and installation of the individual device at a specified location, or (2) the standardized design and installation for a group of measurement devices, for each type of device at various identified locations.

Or,

(ii) A report documenting in-field testing performed on the installed measurement device, or type of device, by individuals trained in the use of field testing equipment, where results are reviewed, signed and stamped by a registered Professional Engineer.

- 2) For devices installed before date of this Article, certification may occur through either:

- A) A report documenting field-testing that is completed on a random and statistically representative sample of existing devices, where results are reviewed, signed and stamped by a registered Professional Engineer. Individuals trained in the use of field-testing equipment shall perform all field-testing.

Or,

- B) A report documenting field-inspections and analysis that are completed for existing devices, where results are reviewed, signed and stamped by a registered Professional Engineer. Individuals trained in the use of field-inspections and analysis shall perform all field-inspections and analysis.

- 3) For compliance under §597.3(b) (measurement at upstream locations of the delivery points to multiple customers) every existing device must be field-tested.

b) Field-Testing and Field Analysis Protocols

- 1) Water measurement device field-testing protocols, including frequency of testing, shall be according to best professional practices. It is recommended the sample be no less than 10% of existing devices, with a minimum of 5, but not to exceed approximately 100, individual devices for any particular device type. Alternatively, the supplier may develop its own sampling plan using an accepted statistical methodology.
- 2) If, during the testing of sampled devices, more than one quarter of the devices tested for any particular device type do not meet the criteria pursuant to §597.3(a)(2), the agricultural water supplier shall provide, in its Agricultural Water Management Plan, a plan to test an additional 10%, with a minimum of 5, but not to exceed an additional 100 individual devices for that particular device type. This second round of testing and corrective actions shall be completed within three years of the initial sample.
- 3) The field-inspections and analysis of every existing individual device shall demonstrate that the design and installation standards used for the installation of existing devices are capable of meeting the requirements of §597.3(a)(2) or

§597.3(b)(2), and that existing operation and maintenance protocols meet best professional practices.

c) Records

- 1) Records documenting compliance with the requirements in §597.3 and §597.4 shall be maintained by the agricultural water supplier for two Agricultural Water Management Plan cycles.
- 2) The records shall include at a minimum: documentation of certification for an individual device or device type as necessary to indicate compliance with §597.3 and additional device-specific data where warranted, including dates of inspections, maintenance, repairs, calibrations and adjustments to the measurement device.
- 3) The results of laboratory testing used to demonstrate compliance with §597.3 shall be provided to the agricultural water supplier in the form of either (1) manufacturer's literature referencing the laboratory testing, or (2) the actual laboratory reports documenting the testing results for the specific device or installation.
- 4) The results of field-inspections and analysis shall be provided to the agricultural water supplier documenting the results for the specific device or installation as a notice of the accuracy stamped and signed by the registered Professional Engineer.

d) Performance Requirements and Reporting

- 1) All measurement devices shall be correctly installed, maintained, operated, inspected, and monitored as described by the manufacturer, the laboratory or the registered Professional Engineer that has signed and stamped certification of the device, and pursuant to best professional practices. Water measurement device testing protocols shall be according to manufacturer's recommendations or design specifications and follow best professional practices.
- 2) If, as part of an agricultural water supplier's field testing or field-inspections and analysis of existing measurement devices or during maintenance and operations, an installed device is determined by the agricultural water supplier to no longer meet the performance requirements of §597.3(a) or §597.3(b), then the agricultural water supplier shall take appropriate corrective action, including but not limited to, repair or replacement to achieve the requirements of this Article.

- 3) For devices identified as out of compliance with §597.3, which the agricultural water supplier is unable to bring into compliance before submission of its Agricultural Water Management Plan, a schedule, financing plan and budget for future corrective actions shall be provided by the agricultural water supplier in its Agricultural Water Management Plan.
- 4) A description of best professional practices associated with (1) the collection of measured data and method of determining irrigated acres, (2) data quality control, and (3) for devices measuring flow rate or velocity, methods for determining volumetric quantities shall be provided in the Agricultural Water Management Plan.
 - A) For devices that measure flow-rate, the documentation shall demonstrate protocols associated with the measurement of the duration of delivery, where volume is derived by the following formula: $\text{Volume} = \text{flow rate} \times \text{duration of delivery}$.
 - B) For devices that measure velocity only, the documentation shall demonstrate protocols associated with the measurement of the cross-section of flow and duration of delivery, where volume is derived by the following formula: $\text{Volume} = \text{velocity} \times \text{cross-section flow area} \times \text{duration of flow}$.
 - C) For devices that measure water elevation at the device (e.g. flow over a weir or differential elevation on either side of a device), the documentation will demonstrate protocols associated with the measurement of elevation where elevation is used to derive flow rate at the device. The documentation will further demonstrate protocols used to derive volume from the elevation values.